Facilities D&D

Goal

Surplus facilities will be decommissioned and decontaminated sufficiently to enable removal or closure through entombment.

Fiscal Year 1998 Objectives

Key objectives included:

- deactivating N Reactor
- placing C Reactor in Interim Safe Storage
- transferring excess property to economic development activities
- streamlining infrastructure systems, and reducing costs associated with supporting infrastructure systems.

Contaminated facilities pose a direct threat to public health and the environment. Uncontaminated structures require constant maintenance to preclude safety hazards. Reusable facilities may support economic development in the Mid-Columbia region.

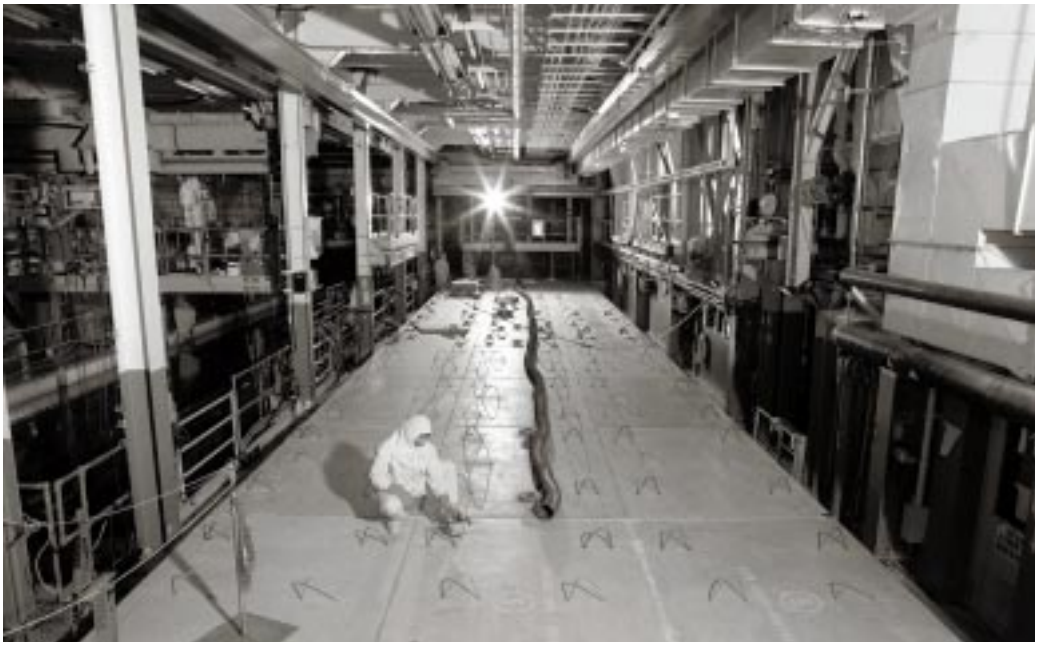
Decontamination reduces the levels of radioactive and hazardous contamination of materials, structures, and equipment. Decommissioning occurs at the end of the useful life of a facility and essentially retires the facility. Activities involved in the decommissioning process include decontamination and dismantlement of the facility.

In fiscal year 1998, significant progress was made in four areas: land and other resources recovered; reduced inventory and materials to be cleaned up; reduction of costly mortgages; and innovative technology applications.

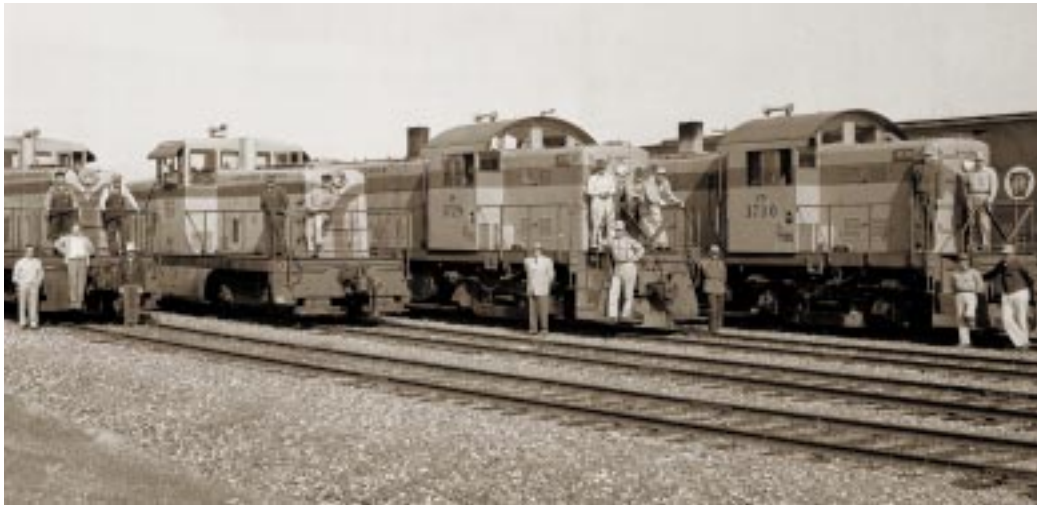
Land and Other Resources Recovered: Economic Benefits

Fiscal year 1998 was a banner year for turning surplus Hanford facilities over to other users for local economic growth. These examples foreshadow the future of many of the valuable resources at Hanford.

- Over 700 square meters (7,500 square feet) of laboratory space was leased to Washington State University, Tri-Cities. The two-year lease, with options for an additional three years, is valued at $52,800 per year.
- The 1100 Area, just north of Richland, was transferred to the Port of Benton for use in economic development of the Tri-Cities region. The transfer included 311 hectares (768 acres), 26 buildings, and 26 kilometers (16 miles) of rail track. The 1100 area was listed in 1989 as one of four Superfund sites on the Hanford Site; in 1996, the 1100 Area became the first of DOE's Superfund sites to be cleaned and released from the list.
- The Livingston Rebuild Center took over management of the portion of the Hanford railroad acquired by the Port of Benton and uses the 1100 Area's Transportation and Maintenance Facility to maintain and rebuild locomotives.



A worker takes radiation readings while standing on concrete shield blocks in the N Fuel Basin



Hanford rail crews pose with their equipment in 1954. In fiscal year 1998, the Hanford rail lines were transferred to the Port of Benton or closed.

• The 172-kilometer (107-mile) Hanford rail lines were transferred to the Port of Benton or closed. The entire southern portion of the rail line went to the Port, along with eight to 10 kilometers (five to six miles) of track from the 1100 Area to the Washington Public Power Supply System. The Hanford rail line also is used by two private businesses.

• RL signed agreements with Cogema Engineering Corporation allowing the company to create more local jobs by authorizing commercialization of under-utilized laboratory equipment in Hanford's 306-E Fabrication, Examination and Development Laboratory. Private work can now be performed in areas such as radiography, ultrasonics, precision welding and fabrication, and mechanical prototyping.

Reduction of Inventory and Materials: N Reactor Deactivated

On July 23, 1998, N Reactor deactivation was completed. The six-year project deactivated the last of the Hanford defense production reactors. Eighty-five facilities were deactivated. The final activity was cleanup of the N Fuel Basin. The spent fuel had been moved to the K Basins for storage several years earlier, but equipment, sediment, and fuel chips remained, along with 4.2 million liters (1.1 million gallons) of contaminated water. In the cleanup activity, 159 kilograms (350 pounds) of spent fuel fragments, 33 grouted monoliths containing 135 cubic meters (4,767 cubic feet) of high-rate exposure hardware and water filters, 1,699 cubic meters (60,000 cubic feet) of low dose debris, and 135 cubic meters (4,767 cubic feet) of highly radioactive sediment were safely disposed of. Finally, the basin was covered with 99 multi-ton concrete shielding blocks.

Reduction and Elimination of Costly Mortgages: C Reactor in Interim Safe Storage

C Reactor is the first DOE reactor to be placed in Interim Safe Storage, which will protect workers and the environment while the radioactivity inside the building decays. The reactor will remain in Interim Safe Storage for up to 75 years; then it will be transported to the center of the site for burial. Delaying removal of the reactor core is expected to dramatically reduce the cost because of the lower level of protection that will be required for the less-radioactive core. In the Interim Safe Storage project, workers removed 23 of the reactor's 24 buildings and 80 percent of the non-radioactive structure around the reactor core, installed a high-strength, corrosion-resistant galvanized steel roof,

Accomplishments

- N Reactor deactivation was completed including the clean-out of the N Fuel Basin.
- C Reactor was placed in Interim Safe Storage, allowing safe storage for up to 75 years.
- 300 Area facilities were leased to Washington State University, Tri-Cities.
- 1100 Area facilities and railroad were transferred to the Port of Benton.
- The Hanford railroad system and the steam plants were shut down.
- The Plutonium Concentration Facility (233-S) decontamination and decommissioning was started.

Near-Term Challenge

The structural integrity of the aging Plutonium Concentration Facility (233-S) is a concern. Carrying out decontamination and decommissioning activities while ensuring worker safety will require extraordinary planning and attention to details.

and removed contaminated waste. Contaminated wastes removed included 63.5 metric tons (70 tons) of lead, 907 metric tons (1,000 tons) of steel, 10,886 metric tons (12,000 tons) of concrete, and 1,542 metric tons (1,700 tons) of soil. Hanford's Environmental Restoration Disposal Facility received 14,152 metric tons (15,600 tons) of low-level waste, and the site's Effluent Treatment Facility received 813,864 liters (215,000 gallons) of contaminated water. The project recycled approximately 363 metric tons (400 tons) of steel, 2.3 metric tons (2.5 tons) of copper, 36 metric tons (40 tons) of lead, and 3.8 liters (1 gallon) of mercury.

In September 1998, four of Hanford's 100 Area electrical substations were de-energized. The substations, dating to 1944, provided power to the critical mission areas along the Columbia River. The end of plutonium production cut the demand for electrical power in the 100 Area; a single substation now provides all electrical service for the 100 Area facilities. Annual savings of $400,000 is anticipated.

Other World War II-era facilities, coal- and oil-fired steam plants in the 200 and 300 areas, were closed in January and March 1998, respectively. The closures will save more than $108 million over 25 years, and significantly reduce emissions of greenhouse gases.

DOE awarded a contract to Johnson Controls, Inc., to provide energy conservation measures. The first Energy Conservation Measure modernizes steam production. The new boilers in the 200 Areas run on high-quality diesel; the boilers in the 300 Area run on natural gas. Both fuels burn cleaner than heavy oil and coal, and they reduce energy consumption by 30 percent while reducing air emissions by over 635 metric tons (700 tons) per year. Johnson safely worked over 183,000 hours without a lost workday accident as the boilers and their associated infrastructure, including over 13.7 kilometers (8.5 miles) of pipe, were installed.

Innovative Technology Applications: Equipment Boosts Efficiency

The two-year project to place C Reactor in Interim Safe Storage allowed field testing of several new technologies aimed at boosting the efficiency of decommissioning activities. Many have been deployed at Hanford and other DOE sites, commercial reactor decommissioning projects, and the Chornobyl reactor complex in Ukraine. Key examples include:

- RESRAD-BUILD, an exposure pathway and analysis code used to determine whether radiologically contaminated buildings and structures can be released for a specific end use

C Reactor facilities before being placed in Interim Safe Storage.

C Reactor after being placed in Interim Safe Storage.

Electrical Substation 151-B is one of four 100 Area substations that were de-energized.

- Concrete Shaver, a self-propelled, electric-powered, diamond-coated concrete shaving machine that removed the contaminated surface layer of concrete floors and walls
- Concrete Spaller, a hand-held hydraulically operated device to remove a surface layer of concrete 17.8 to 40.6 centimeters (7 to 16 inches) in diameter and 0.318 to 5 centimeters (1/8 inch to 2 inches) thick
- Dust Suppression System, which uses a high-pressure water spray to control concrete dust generated during demolition
- Compact Subsurface Soil Investigation System, a small mobile unit that hydraulically retrieves soil samples through holes drilled in the floor of restricted areas
- Concrete Grinder, a hand-held diamond grinder with a vacuum port to gather dust
- High-Speed Clamshell Pipe Cutter, which cuts pipes in place and requires only 17.8 centimeters (7 inches) of radial clearance. The unit is fast, safe, and involves no heat, flame, or smoke
- Wireless Remote Radiation Monitoring System, a personnel and area dosimetry system that uses radio to transmit readings in real time to a central control location.

In another part of Hanford, the Andros Robot was used to examine the railroad tunnel at the 221-U Facility. The fully remote robot includes cameras, radiation monitoring, and smear sample collecting pads.